

# ASSESSMENT OF THE PATTERN OF INTERTIDAL COMMUNITY COMPOSITION AS A FUNCTION OF DISTANCE FROM THE ALDER CREEK LANDSLIDE

Christy Bell, Maya George, Melissa Redfield, Peter Raimondi  
University of California, Santa Cruz

## INTRODUCTION

In spring 2011, a series of landslides occurred along Highway 1 south of Big Sur, California where Alder Creek meets the ocean (Figures 1, 2 and 3). Surveys were conducted to characterize the intertidal community near the Alder Creek landslide in December 2012 and again in December 2013.

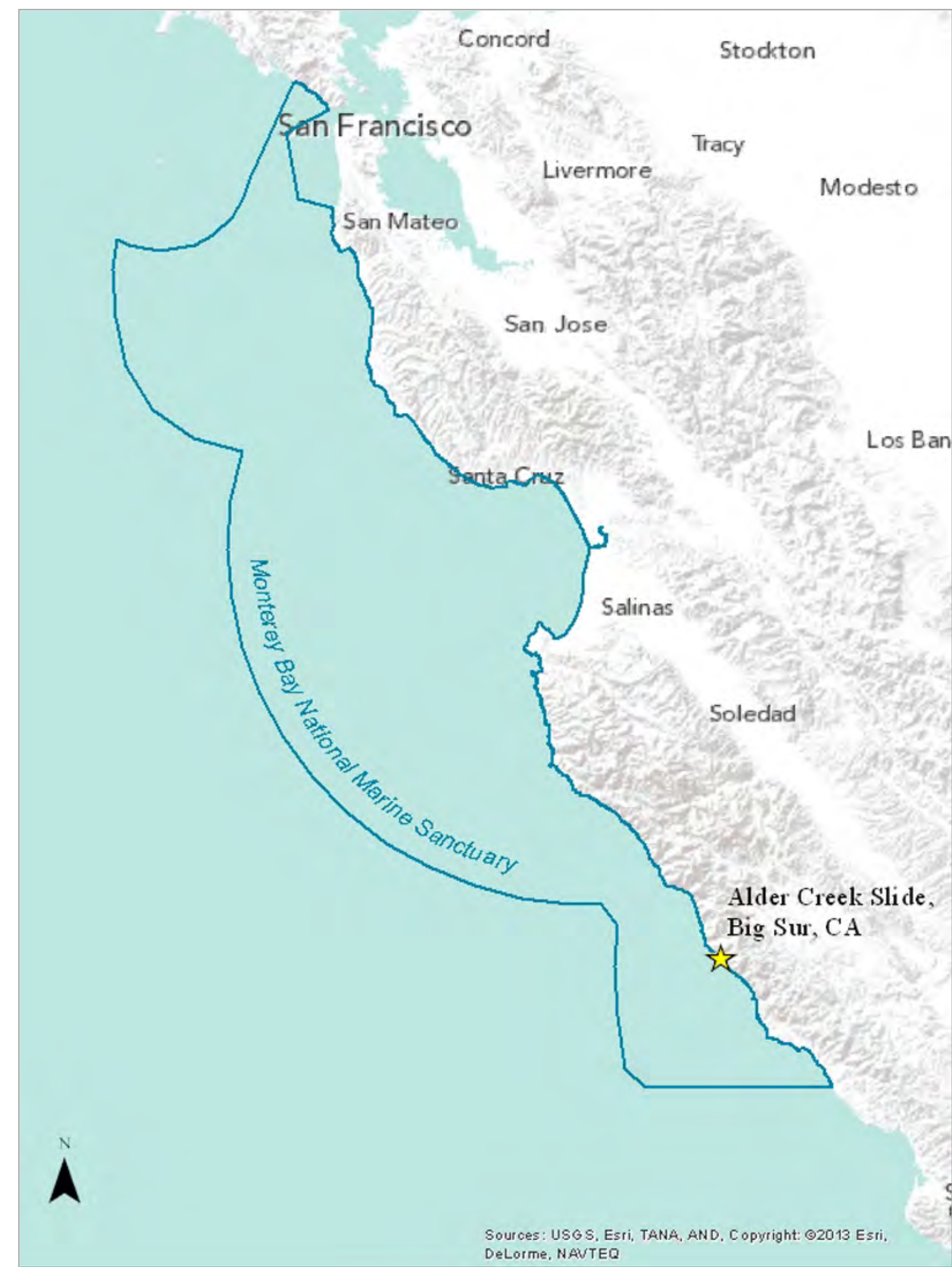


Figure 1. MBNMS boundaries and location of the Alder Creek landslide.

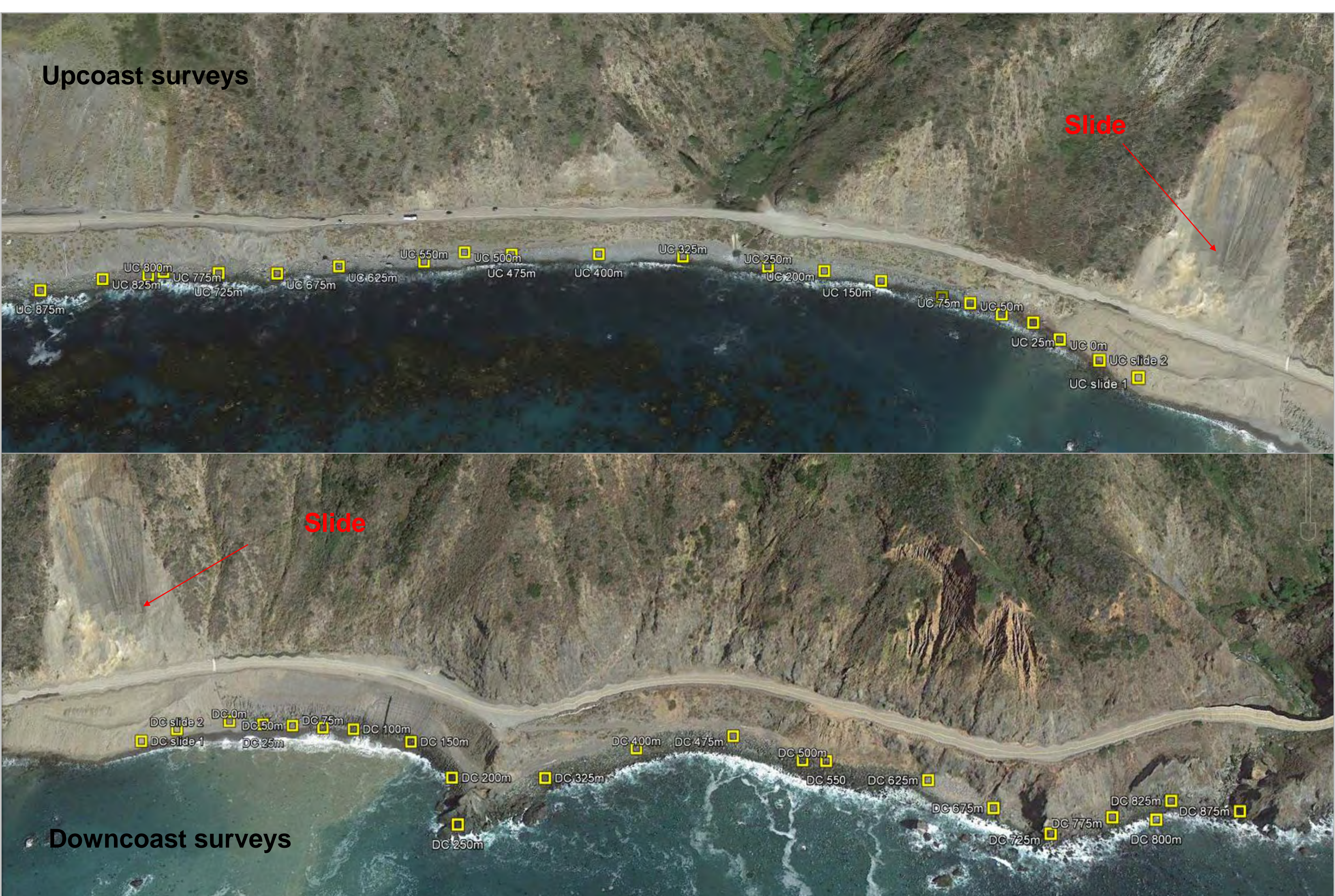


Figure 2. Geometric scaling sample design upcoast and downcoast of the slide.



Figure 3. Changes in the area downcoast of the slide over time.

Because of the gradient of tidal exposure, intertidal areas have strong species zonation patterns. Often this gradient is divided into three zones: high, mid and low. Our surveys were designed to sample the shoreline so that all three zones would be evaluated (Figure 7).

## QUESTIONS

1. Does the pattern of community composition vary as a function of distance from the slide?
2. Does the pattern of community composition change as a function of time since the slide?
3. If so, are changes consistent with an impact to the community resulting from a landslide?

## METHODS

- 3 transects parallel to shore (high, mid, low zones) ~ 1000m upcoast (UC) and downcoast (DC) of the landslide (Figure 7).
- Photos and GPS coordinates collected for all quadrats (Figure 4).
- 132 quadrats to count sessile species (Figure 5) and mobile invertebrates (Figure 6). Quadrat location determined using a geometric scaling design (Figure 2).

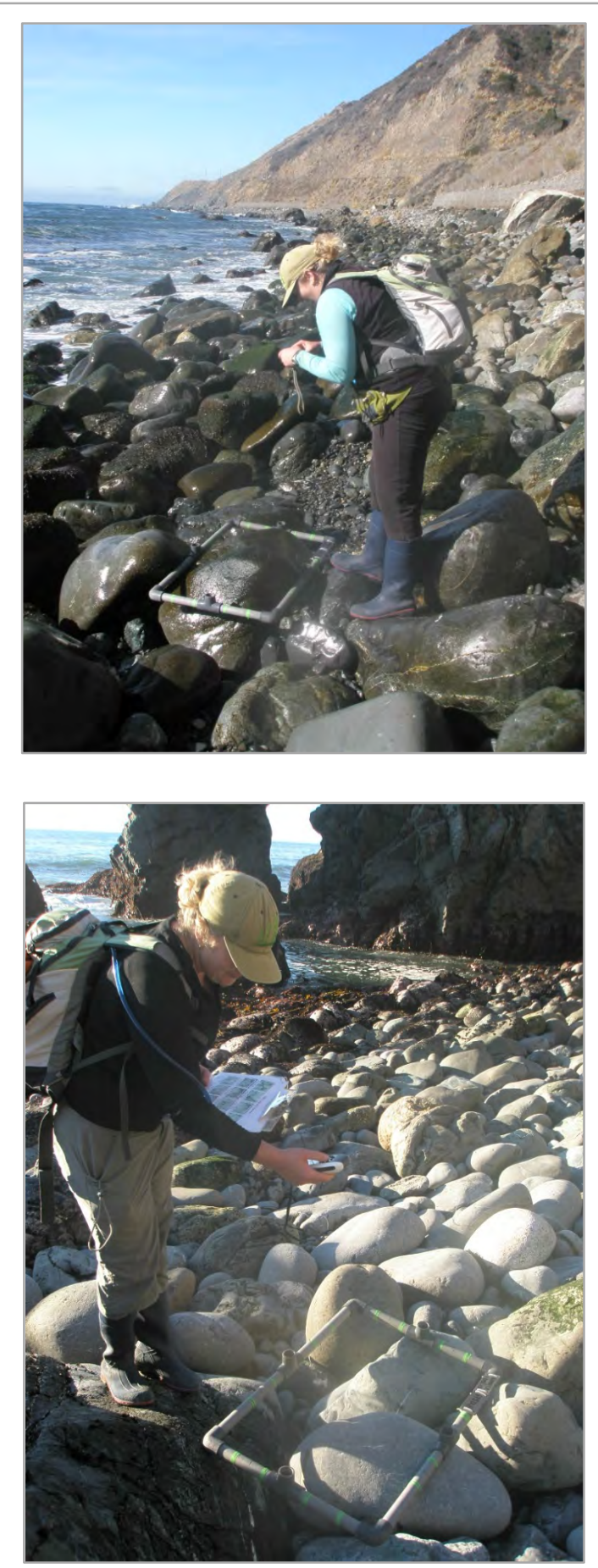


Figure 4. Photos (top) and GPS coordinates (bottom) collected for all quadrats.



Figure 5. Photo quadrat scoring of 100 points for sessile species.



Figure 6. Quadrat sampling for mobile invertebrates.

## PRELIMINARY RESULTS

As expected, the pattern of community composition varied as a function of distance from the slide ( $p=0.001$ ) and there was a strong effect by intertidal zone ( $p=0.001$ ) (Figure 8). We found the pattern of community composition did not change over time ( $p=0.176$ ).



Figure 7. Parallel transects upcoast of the slide in the high, mid, and low zones; close-up of transect setup.

Many of the patterns observed were driven by the accumulation of sand just downcoast of the slide (Figure 2 and 8). Overall, 89 species of algae and invertebrates were observed in our surveys.

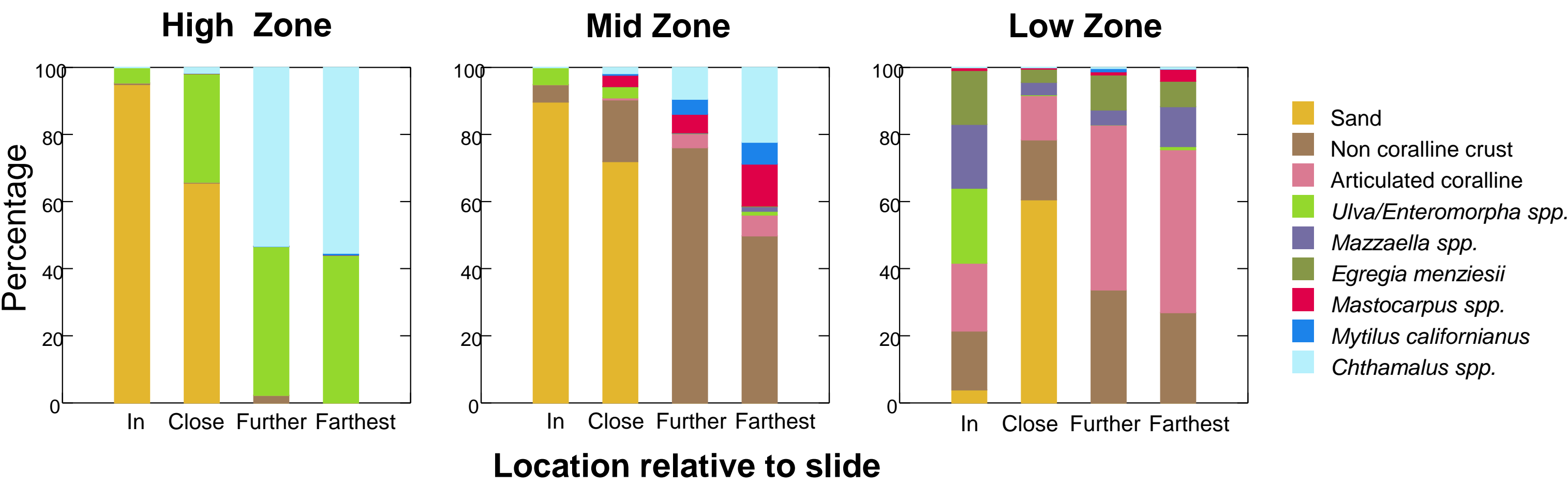


Figure 8. Since there was no effect by year, the data shown are 2012 and 2013 combined. In = under the slide, Close = from the edge of the slide to 250m UC and DC, Further = from 325m to 625m UC and DC (rip rap) and Farthest = 650m to 975m UC and DC ("natural").

## FUTURE WORK

Surveys will be conducted again in December 2014. The subsequent surveys and data analyses will help determine if the patterns of intertidal community composition change over time and if they are consistent with an impact to the community resulting from the landslide.

